

# Small Groundwater Systems: Field Compliance Guide for Drinking Water Owners and Operators

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This guide is intended to help small, groundwater public water systems remain in compliance and prepare for inspections, or “sanitary surveys,” from ADEQ. It is not a full list of regulatory requirements for public water systems. Please contact ADEQ (or your delegated county) with questions about drinking water compliance.



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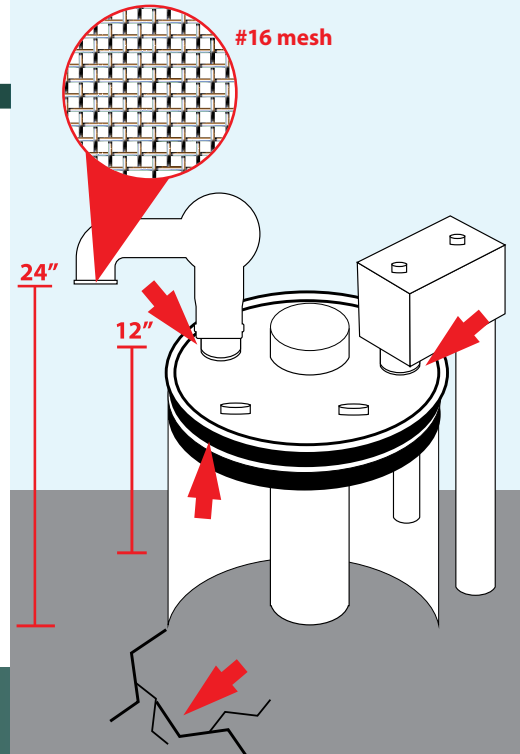
## Wellheads

- Protect your source water from contamination with properly constructed and maintained wellheads. ADEQ inspects wellhead components for the protection of human health.
- Wells should be protected from 100-year flood events.
- Drainage should be away from the slab.
- A raw water sampling tap must be installed at each wellhead before any treatment or disinfection.
- Good housekeeping must be employed to control vegetation and keep debris from accumulating.
- Well slab cracks must be sealed.
- Well slab must be at least 6 feet across.
- The casing must extend at least 12 inches above the slab.



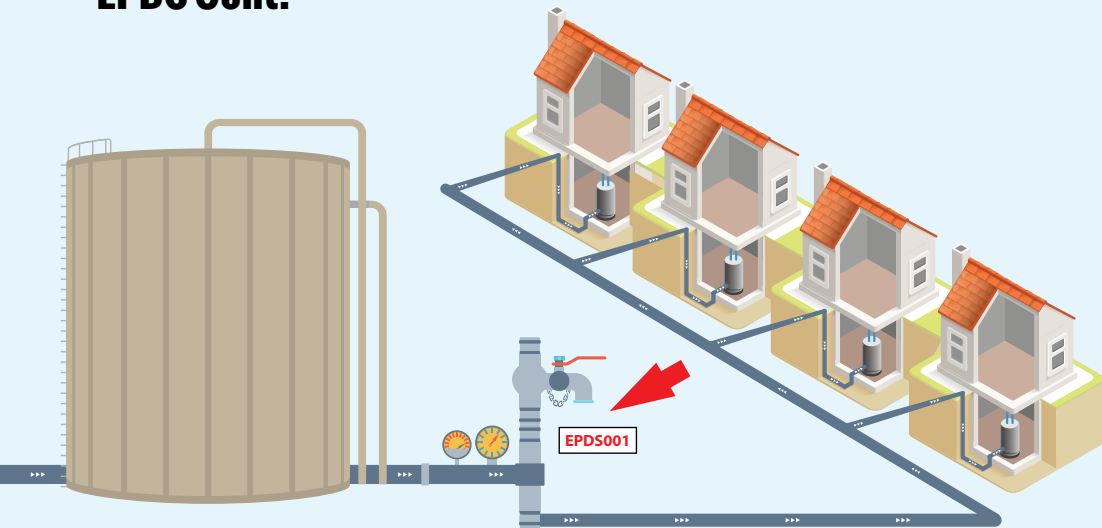
## Wellheads Cont.

- Well vents must be turned downward and terminate at least 2 feet above the slab.
- Well vents must have a No. 16 non-corrosive mesh screen covering the opening.
- Well caps should fit tightly and include an airtight gasket seal.
- Adequate fencing or a structured building must be installed around a well.
- The Well ID No. (or “55- number”) should be clearly posted.
- All openings in the well must be sealed, including openings for electrical conduit.



## Entry Point to the Distribution System (EPDS)

- An EPDS is a compliance sampling point located:
  - On a finished water line
  - After the well, disinfection, treatment, blending and storage facilities—whichever is last in the process flow
  - Prior to the first service connection
- Each EPDS must contain a sampling tap, preferably without threads.
- ADEQ's EPDS number should be clearly marked on each EPDS near the sample tap.
- ADEQ's Monitoring Assistance Program (MAP) samples are collected from these taps.
- Increased monitoring for the MAP parameters is conducted by the water system at the same EPDS taps.
- Samples collected from an EPDS must be labeled with the EPDS number.



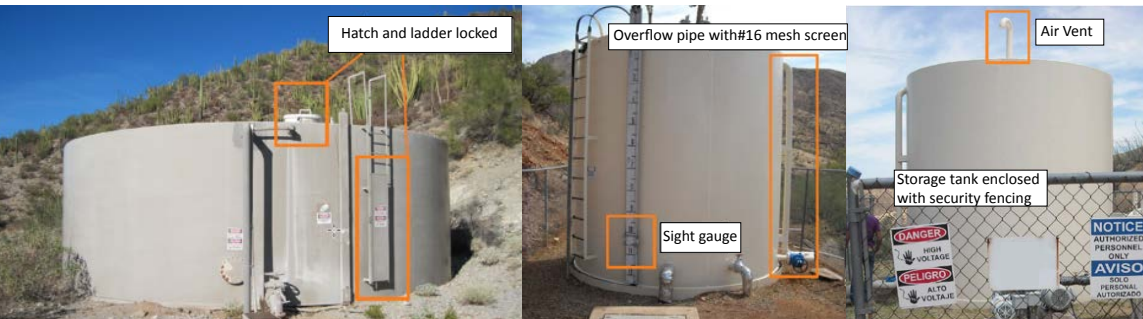
## Storage Facilities

Community water systems and non-community systems serving residents and schools must have minimum storage capacity equal to the current, average daily demand during the peak month of the year. For multi-well systems, the minimum storage capacity may be reduced by the amount of the total daily production capacity minus the production from the largest producing well.

- The drains should be air-gapped from sanitary sewers, storm drains or irrigation conveyances.
- Vents and overflow pipes must have a No. 16 non-corrodible mesh screen covering the openings.
- Overflow pipes should be sized in accordance with design flow of the tank and extend to within 2 feet of the ground, discharging onto a spill pad or rip rap to prevent erosion.
- Hatches should fit securely and be equipped with a gasket or seal and a locking device.
- Finished storage tanks must have a water-tight roof or cover.
- The area within 100 feet of a tank should be graded to provide drainage away from the tank.

## Storage Facilities Cont.

- Tanks should be free of rust and leaks.
- Tank foundations should **NOT** be buried with soil. Vegetation should be cleared from around water storage tanks.
- Recommendations include: additional security, working mechanical gauge or alarm, flood protection and ability to isolate tanks from the system for maintenance and cleaning.



## Monitoring Assistance Program (MAP)

### Who Is Required to Participate in MAP?

- All community and non-transient/non-community public water systems (except state or federally owned water systems) serving less than 10,000 people.
- MAP collects most of the routine samples for participating systems. However, total coliform, disinfection byproducts, minimum residual disinfection levels and lead and copper sampling remains the responsibility of public water systems.
- MAP samplers will not sample EPDSs that are not on the MAP schedule.
- If the MAP sampler is unable to collect a sample, sampling responsibility is transferred from MAP to the water system.
- ADEQ's Compliance Assistance Coordinators can be consulted to help identify a system's EPDSs.
- MAP monitoring schedules are available online at [azdeq.gov/map](http://azdeq.gov/map).

# Pressure Tanks

Pressure tanks are used to maintain pressure in a water system by means of compressed air. They can also help prolong the life of system pumps by reducing the frequency of on-off cycles. Pressure tanks should not be considered for meeting water storage needs as they provide no emergency reserve capacity.

Pressure tanks must contain:

- an operational pressure gauge
- an operational pressure relief valve (hydro-pneumatic tanks only)



# Distribution Systems

Total coliform, disinfection byproducts, minimum residual disinfection levels and lead and copper sampling is conducted within the distribution system. This testing is the responsibility of the public water system.

- The system pressure must be in between 20-100 PSI at all points throughout the system. Recommended pressure is 35 to 75 PSI.
- Use additives, materials and equipment certified for potable water (ANSI/NSF Standards 60 and 61). Separate non-potable connections must be labeled to prevent consumption.
- Air gaps should be installed for abandoned or inactive system components such as unused wells and tanks.
- Backflow prevention assemblies should be installed and maintained (see next section).
- Asbestos-containing pipe in normal, non-friable condition is not regulated under the federal Asbestos NESHAP rules. If the pipe conditions change through deterioration or mechanical crushing, Asbestos NESHAP requirements may apply. Visit ADEQ's asbestos web page for additional information, including a contact phone number: [azdeq.gov/Asbestos](http://azdeq.gov/Asbestos).
- Removal and repair of asbestos-containing pipe is subject to federal OSHA requirements for worker health and safety. For related contact information, visit the Arizona Division of Occupational Safety and Health main page: [azica.gov/divisions/adosh](http://azica.gov/divisions/adosh).

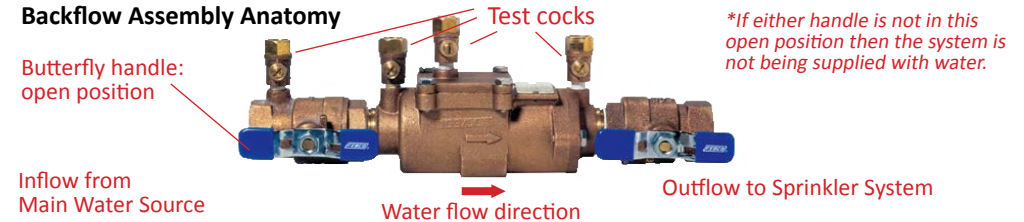
# Backflow Prevention

Public water systems must be protected from cross connections. A cross connection is a physical connection that provides an opportunity for non-potable water to contaminate potable water.

Proper backflow prevention assemblies should be installed when:

- A substance harmful to human health is handled in a manner that could permit its entry into a public water system.
- An unapproved water supply exists on the users' property.
- An unprotected cross-connection exists or a cross-connection problem has previously occurred on the user's premises.

## Backflow Assembly Anatomy



# Backflow Prevention Cont.

## Additional Requirements:

- Water system personnel should seek out unprotected cross connections and eliminate them.
- An air gap is a vertical separation at least twice the diameter of the water supply line. Proper air gaps are considered the most protective type of backflow prevention.
- Required backflow prevention assemblies should be located as close as practicable to the service connection.
- Each backflow prevention assembly should be tested by a certified tester at least annually and after installation, relocation or repair.
- Defective assemblies should be repaired or replaced.
- Detailed records should be kept for at least 3 years.
- Within 5 days of a cross-connection problem, a water system must notify ADEQ (or delegated county) and the local health authority in writing.

For more information, consult Arizona Administrative Code R18-4-215.

# Disinfection

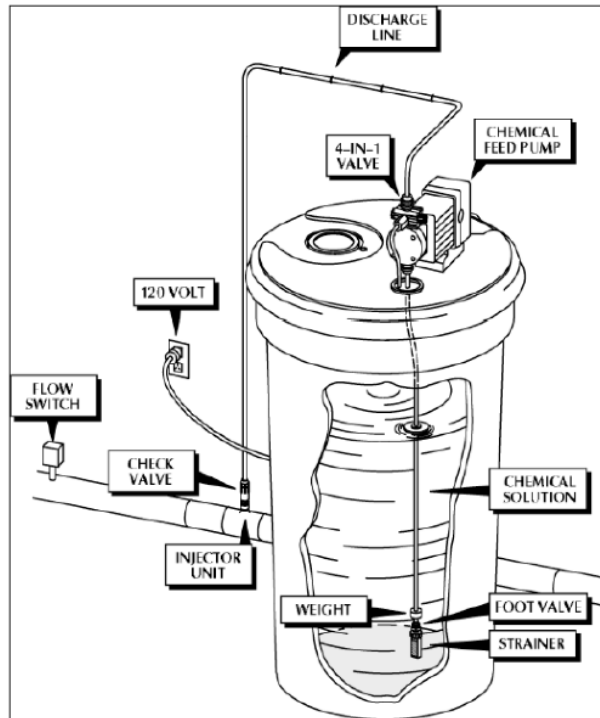
- Disinfectants must be labeled to demonstrate that they meet the ANSI/NSF Standard 60 approval for drinking water purposes.
- Sodium Hypochlorite Disinfectant degrades per the following table:

Table 1 Effect of Concentration and Temperature				
Initial Concentration*	Half-Life In Days			
	90° F	85° F	80° F	75° F
20 Percent	22.4	31.8	51.2	69.2
15 Percent	48	68	100	148
10 Percent	115	164	241	357
5 Percent	371	527	735	1147

**\* Concentration stated as trade percent available chlorine**

- Chlorine dosage should be measured daily and calculated based upon flow and strength of the disinfectant.
- Maximum residual disinfection levels must be monitored at the same time and location as bacteriological samples.
- Maximum levels must not exceed 4.0 mg/l.
- Minimum levels must be detectable.





Operations and maintenance manuals must be easily accessible and periodically reviewed by staff. They should include at a minimum:

- Blueprints/schematics of the type of treatment installed.
- Normal operating procedures.
- Procedures for backwash/media regeneration.
- Guidance on maintaining the proper operation and maintenance over the life of the facility.
- Information on where to purchase replacement parts, chemicals and media.
- What to do in the event of an emergency situation.

## Treatment Systems Cont.

Systems with point-of-use devices must collect samples and submit them to a certified laboratory on one-third (1/3) of the total devices installed. All point of use devices must be tested by a certified laboratory on a triennial basis. Consult with your ADEQ Compliance Assistance Coordinator for more information.

Is treatment operational and properly maintained?

At what stage of life is the filter media?

Are the treatment chemicals maintained and SDSs available?

Are any processes being bypassed due to equipment failure or other emergency situations?

Is the operations and maintenance manual being followed?

## System Plans

System plans must be easily accessible. They are also subject to review during ADEQ's inspections.

**Microbiological Sample Siting Plan (MSSP):** Every public water system must have an approved MSSP. Routine and repeat samples (including groundwater rule samples) should be collected according to the MSSP.

**Emergency Operations Plan (EOP):** All community water systems, regardless of size, are required to develop and maintain an EOP. The EOP details physical and technical aspects of water systems operation, such as maintaining proper water pressure, collapse of a major structure or loss of mechanical components like pumps or valves. The EOP should also address public notice and alternate water supplies. A template is available at [azdeq.gov/EmergencyOps](http://azdeq.gov/EmergencyOps).

**Lead and Copper Monitoring Plan:** Every community and non-transient/non-community public water system must collect lead and copper samples in accordance with an approved lead and copper sampling plan. Plan preparation helps ensure samples are collected from proper sites and taps and that the required number of samples are collected.

**Compliance Monitoring Plan for the Stage 2 Disinfection Byproducts (Stage 2 DBP):** Systems which use a chemical disinfectant must collect total trihalomethanes (TTHM) and halo acetic acid (HAA5) samples according to an approved Compliance Monitoring Plan (CMP).

ADEQ's Compliance Assistance Coordinators can be consulted for assistance with system plans.

## Safe Drinking Water Information System (SDWIS)

ADEQ's online Safe Drinking Water Database can help owners and operators of public water systems stay in compliance with the Safe Drinking Water Act.

By accessing SDWIS, owners and operators can find information on:

- Sample schedules
- Sanitary surveys
- Violations
- Compliance schedules
- Sample data
- Facilities associated with a water system
- Population served
- Much more!

For guidance on how to use SDWIS, visit [azdeq.gov/SafeDrinkingWater](https://azdeq.gov/SafeDrinkingWater) and click on the right-hand sidebar link ***Safe Drinking Water Database / Guide***.

## Maximum Contaminant Level (MCL) Violations

- Public water systems should carefully review all sampling data.
- Sampling data should be compared to MCLs, or to action levels (ALs) for lead and copper testing.
- MCLs and ALs can be viewed on EPA's Web site: [epa.gov/sdwa](http://epa.gov/sdwa).
- For total-coliform positive samples, collect samples again within 24 hours of notification of the result and consult with ADEQ (or delegated county) as soon as possible.
- MCL violations and AL exceedances have public notice and follow up requirements.
- Consult with your ADEQ Compliance Assistance Coordinator (or delegated county) upon learning of an MCL violation or AL exceedance.

## Total Coliform Sampling Procedures

Be familiar with your sampling schedule and Microbiological Sample Siting Plan (MSSP).

Sampling procedures:

- Collect samples per the locations specified in the MSSP.
- Wear gloves.
- Remove any attachments on the faucet, including aerators.
- Prior to sample collection, spray sample tap with a solution strength of 70 percent (70%) isopropyl alcohol.
- Allow water to flow for 5 or 6 minutes before sampling.
- Reduce the water flow to avoid splashing while collecting the sample.
- Do not rinse or overfill container.
- Always collect cold water; never sample hot water.
- Don't touch the inside of the sample bottle or its cap and don't set the cap down.
- Place samples in an ice chest.
- Complete the lab forms or chains of custody.
- Deliver the sample to a state-certified laboratory within the established sample hold times. Review lab results as soon as they are available.

## Total Coliform Sampling Procedures Cont.

For positive samples, take repeat samples according to the MSSP and contact your ADEQ Compliance Assistance Coordinator (or delegated county) for help with additional requirements.

If possible, avoid:

- Outdoor faucets
- Leaky faucets
- Faucets connected to cisterns, softeners, pumps, pressure tanks or hot water heaters
- Faucets supplying hot and cold water
- Faucets positioned close to a sink or ground
- New plumbing fixtures or those recently repaired
- Threaded taps; swing spouts
- Sampling outdoors on windy or rainy days

## Record keeping

All public water systems must retain records per schedules established in the Code of Federal Regulations.

The records should be kept on the premises of the water system or at a convenient location near its premises.

Record keeping requirements vary by document type, ranging from 3 to 12 years (for groundwater systems). Consult EPA's *Small System Record Keeping Rules Quick Reference Guide* for details:

**[epa.gov/dwreginfo/drinking-water-rule-quick-reference-guides](https://www.epa.gov/dwreginfo/drinking-water-rule-quick-reference-guides)**

These record keeping requirements are minimum time frames. ADEQ recommends keeping records indefinitely, where possible.

Benefits of complete, well-organized records include:

- Information to help solve system problems and resolve customer complaints
- Training material for new staff
- Ability to observe trends in water use, quantity and quality
- Record keeping compliance

## Other System Requirements

- Retain a certified operator at the appropriate grade level for your distribution system (and treatment system if applicable).
- Notify ADEQ (or delegated county) within 10 days of change in operator.
- Maintain and keep in proper operating condition all water supply facilities.
- Report emergencies, incidents and violations within 24 hours.
- Regularly check your monitoring schedules on SDWIS.
- Sample and submit monitoring data on time.
- Community systems must distribute consumer confidence reports and submit them to ADEQ (or delegated county) no later than July 1, and submit a certification no later than October 1.
- Receive an Approval to Construct (ATC) before beginning new construction or modifications of system components.
- Receive an Approval of Construction (AOC) before operating any newly constructed or modified system components.
- Provide public notice of violations to customers with a copy and proof of issuance to ADEQ (or delegated county).
- For seasonal systems, certify prior to serving water to the public that state-approved startup procedures have been completed.

## Contacts and Online Resources

- ADEQ Emergency Response 24/7 Hotline: **602-390-7894**
- List of ADEQ Compliance Assistance Coordinators: **[azdeq.gov/DWComplianceAssistance](https://www.azdeq.gov/DWComplianceAssistance)**
- Safe Drinking Water Information: **[azdeq.gov/programs/water-quality-programs/safe-drinking-water](https://www.azdeq.gov/programs/water-quality-programs/safe-drinking-water)**
- Public Water System Requirements: **[azdeq.gov/wq/pws/requirements](https://www.azdeq.gov/wq/pws/requirements)**
- Maricopa County Safe Drinking Water Program: **[maricopa.gov/2353/Drinking-Water-Quality](https://www.maricopa.gov/2353/Drinking-Water-Quality)**
- Pima County Safe Drinking Water Program: **[webcms.pima.gov/government/environmental\\_quality/water/](https://webcms.pima.gov/government/environmental_quality/water/)**
- Operator Certification Program: **[azdeq.gov/OperatorCertification](https://www.azdeq.gov/OperatorCertification)**
- ADEQ Source Water Protection Program: **[azdeq.gov/SourceWaterProtection](https://www.azdeq.gov/SourceWaterProtection)**
- ADEQ Community Liaisons: **[azdeq.gov/CommunityLiaisons](https://www.azdeq.gov/CommunityLiaisons)**
- To submit drinking water data and reports to ADEQ: **[WQD\\_Compliance\\_Data@azdeq.gov](mailto:WQD_Compliance_Data@azdeq.gov)**

[azdeq.gov](http://azdeq.gov)

